



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/566,280

06/15/2006

Yundong Wang

4662-140

5147

23117 7590 06/02/2009
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

06/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,280	Applicant(s) WANG ET AL.	
	Examiner RIP A. LEE	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1796

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 27, 2009 has been entered.

Claim Rejections - 35 USC § 102 / 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-10 and 12-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ouhadi (EP 757 077); extrinsic evidence furnished in Jourdain *et al.* (U.S. 5,571,883), Hazelton *et al.* (U.S. 4,607,074) and Thompson (U.S. 2006/0216019).

Entry 1 of Table 1 of Ouhadi teaches a composition comprising 26.82 wt % of V 3666 EPDM (contains 42.9 % extender oil and 57.1 % elastomer, or, in terms of overall EPDM composition, 11.15 wt % oil and 15.3 wt % EPDM), 7.77 wt % of RP 210 polypropylene resin, and 35.17 wt % of Flexon 876 processing oil. The composition further contains 14.30 wt % of Cariflex 1220 butadiene rubber. Cure is achieved with 1.40 wt % of SP 1045 phenolic resin.

V 3666 is an EPDM copolymer having an ethylene content of 58 wt % and an ethylidene-norbornene content of 4.5 wt % (see Jourdain *et al.*, col. 13, line 61).

The total amount of oil is $11.5 + 35.17 = 46.67$ wt %, and the ratio of oil to elastomer is $46.71/11.5 = 3.05$. Thus, the oil/elastomer ratio is at least 3/1. The amount of thermoplastic polyolefin, RP 210, is less than 10 wt %, relative to the total weight of the composition. The final composition exhibits a Shore A hardness (5 sec) of 34 and good surface aspect.

Art Unit: 1796

Shore A hardness is reported at 5 sec delay time rather than at 15 sec delay time, as recited in instant claims. However, it is known that the value of Shore A hardness diminishes with increasing delay time. For instance, Hazelton *et al.* (Table II, entry 1) reports a Shore A (instantaneous) of 62 compared with Shore A (15 sec) of 50 for the same elastomer. Thompson (paragraph [0038]) reports a Shore A (5 sec) of 57 compared with Shore A (15 sec) of 40 for the same elastomer. It follows that the composition disclosed in Ouhadi will exhibit a Shore A considerably less than 34 at a longer delay time of 15 sec.

The reference is silent with respect to the granulometric properties recited in instant claims 1-6, 9, and 10, however, in light of the fact that the composition is substantially the same as that described in the instant claims, and in view of the fact that polymer exhibits the same Shore A hardness and good surface aspect, both of which would govern the anti-blocking characteristic exhibited in the specific test recited in the claims, a reasonable basis exists to believe that the composition of Ouhadi is capable of exhibiting substantially the same properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

Regarding claim 8, Ouhadi teaches that compositions are preferably fully cured, but they may be partially cured. The level of cure for the cited example has not been determined, however, it is reasonable to believe that cure of at least 98 % is achieved, since the Shore A hardness of the polymer composition, which is governed in part by the extent of cure of the elastomer, is within the claimed range. Furthermore, the examiner believes that the difference between Ouhadi's recited "fully cured" and the claimed cure level of 98 % are within experimental error, and that there would be little difference in physical properties at that upper bound.

Multiple references are permitted under 35 U.S.C. 102 when the extra reference is cited to show that a characteristic not disclosed in the reference is inherent. Note that the critical date of extrinsic evidence need not antedate the filing date. See MPEP § 2131.01.

Art Unit: 1796

4. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouhadi.

Shore A hardness is reported at 5 sec delay time rather than at 15 sec delay time, as recited in instant claims. However, it is known that the value of Shore A hardness diminishes with increasing delay time. For instance, Hazelton *et al.* (Table II, entry 1) reports a Shore A (instantaneous) of 62 compared with Shore A (15 sec) of 50 for the same elastomer. Thompson (paragraph [0038]) reports a Shore A (5 sec) of 57 compared with Shore A (15 sec) of 40 for the same elastomer. It follows that the composition disclosed in Ouhadi will exhibit a Shore A considerably less than 34 at a longer delay time of 15 sec, and since the composition is substantially the same as that described in instant claims, reasonable basis exists to believe that the composition will exhibit the claimed Shore A value. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Additionally, Ouhadi teaches that “very soft” elastomer compositions of the instant invention are characterized by a Shore A hardness in the range of about 20 to about 60. Thus, the Ouhadi reference is fully intending in making very soft compositions having a Shore A value of 20. One of ordinary skill in the art gleans from examples 9 (24.47 parts of oil, Shore A = 37) and 10 (30.47 parts of oil, Shore A = 33) that an increase of oil in the overall formulation results in the formation of a softer elastomer composition. Thus, it would have been obvious to one having ordinary skill in the art to incorporate an increased amount of oil, which is a known softening agent for elastomers, in order to make thermoplastic elastomer compositions having the lower limit of Shore A hardness (value of 20), and the person of ordinary skill in the art would have expected this modification to work with a reasonable expectation of success.

Art Unit: 1796

5. Claims 1-10 and 13-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hamanka *et al.* (U.S. 5,187,224); extrinsic evidence furnished Hazelton *et al.* (U.S. 4,607,074) and Thompson (U.S. 2006/0216019).

Hamanka *et al.* teaches a composition prepared by partially crosslinking 69 parts by weight (pw) of EPDM (3-20 wt % of ethylidene norbornene; see col. 3, line 53), 69 pw of oil, 17 pw of propylene-butene copolymer, and compounding the crosslinked product with 100 pw of SEBS elastomer, 15 pw of propylene-ethylene copolymer, and 250 pw of oil; see entry 6 of Table 1.

The total amount of components ($69 + 69 + 17 + 100 + 15 + 250$) is 520 parts. The total amount of polyolefin is $(17 + 15)/520 = 6.15$ wt %, which is well below the claimed upper limit of 10 wt %. The ratio of oil to EPDM is $(69 + 250)/69 = 4.62$, which exceeds the lower limit of 2/1 of instant claim 1 and the lower limit of 3/1 as recited in instant claim 17. The final composition exhibits a Shore A hardness (instantaneous value; col. 8, line 11) of 24.

It is known that the value of Shore A hardness diminishes with increasing delay time. For instance, Hazelton *et al.* (Table II, entry 1) reports a Shore A (instantaneous) of 62 compared with Shore A (15 sec) of 50 for the same elastomer. Thompson (paragraph [0038]) reports a Shore A (5 sec) of 57 compared with Shore A (15 sec) of 40 for the same elastomer. It follows that the composition disclosed in Hamanka *et al.* will exhibit a Shore A of less than 24 at a longer delay time of 15 sec.

Hamanka *et al.* does not quantify the degree of cure of the elastomer, however, it is reasonable to believe the level of cure lies within the range recited in claim 8 because the Shore A hardness of the polymer composition is governed in part by the extent of cure of the elastomer. The reference is also silent with respect to the granulometric properties recited in instant claims 1-6, 9, and 10, however, in light of the fact that the composition is substantially the same as that described in the instant claims, and in view of the fact that polymer exhibits the same Shore A hardness, which would govern the anti-blocking characteristic exhibited in the specific test recited in the claims, a reasonable basis exists to believe that the composition of Hamanka *et al.* is capable of exhibiting substantially the same properties. Since the PTO can not conduct

Art Unit: 1796

experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

6. Claims 1-10 and 12-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tanaka (U.S. 5,349,005).

Tanaka teaches a dynamically vulcanized composition comprising 100 parts by weight (pw) of EPDM (ethylidene norbornene), 40 pw of crystalline ethylene-propylene block copolymer, 15 pw of low molecular weight polypropylene homopolymer, 400 pw of a paraffinic mineral oil (KV₄₀ = 100 cSt), and 5 pw of phenolic resin curing agent wherein said composition exhibits a Shore A hardness of 21; see Table A3-1, comparative example A9.

Tanaka does not quantify the degree of cure of the elastomer, however, it is reasonable to believe the level of cure lies within the range recited in claim 8 because the Shore A hardness of the polymer composition is governed in part by the extent of cure of the elastomer. Tanaka is also silent with respect to the granulometric properties recited in instant claims 1-6, 9, and 10, however, in light of the fact that the composition is substantially the same as that described in the instant claims, and in view of the fact that polymer exhibits the same Shore A hardness, which would govern the anti-blocking characteristic exhibited in the specific test recited in the claims, a reasonable basis exists to believe that the composition of Tanaka is capable of exhibiting substantially the same properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

Art Unit: 1796

7. Claims 1-10 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dozeman (U.S. 2005/0215717).

Dozeman teaches a dynamically vulcanized composition comprising between 5-10 wt % of thermoplastic polyolefin, elastomer selected from EPM and/or EPDM (claims 1-5). The composition comprises 155-250 parts of oil per 100 parts of elastomer (paragraph [0018]). The oil/elastomer weight ratio is above 1.7 (paragraph [0019]). In the working examples, entry II of Table I shows a composition comprising 8.8 wt % of polypropylene homopolymer, 29.32 wt % of EPDM, and 58.70 wt % of oil (oil/EPDM ratio = 2.0) exhibiting a Shore A hardness of 30. While examples do not show compositions in which the oil/EPDM ratio is at least 2.1/1, it would have been obvious to the person of ordinary skill in the art to make a composition with a higher quantity of oil since Dozeman teaches that compositions can contain up to 250 parts of oil per 100 parts of elastomer (*i.e.*, 2.5/1 ratio). The person of ordinary skill in the art also recognizes that the oil/elastomer ratio is a result effective variable since the ratio clearly affects Shore A hardness of the composition (compare entry I (1.6 ratio, Shore A 44) with entry II (2.0 ratio, Shore A 30)). Thus, an increase in oil affords a softer material. Hence, the choice of a particular ratio of oil to elastomer, such as the amount in present claims, is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art. The person of ordinary skill in the art would have been motivated to vary the oil/elastomer ratio up to the prescribed maximum of 2.5/1 in order to achieve appropriate Shore A hardness of the resulting composition.

The reference is silent with respect to the granulometric properties recited in instant claims 1-6, 9, and 10, however, in light of the fact that the composition is substantially the same as that described in the instant claims, and in view of the fact that polymer exhibits the same Shore A hardness and good surface aspect, both of which would govern the anti-blocking characteristic exhibited in the specific test recited in the claims, a reasonable basis exists to believe that the composition of Dozeman is capable of exhibiting substantially the same properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ

Art Unit: 1796

430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

With regard to degree of vulcanization, Dozeman teaches that inventive compositions may be vulcanized to a gel content of higher than 70 %, and preferably higher than 90 %, 93 %, and 95 % (paragraph [0017]). Thus, one of ordinary skill in the art would have found it obvious to achieve the degree of curing set forth in instant claim 8. From the discussion in paragraph [0010] and [0013] as well as example V, one of ordinary skill in the art would have found it obvious to incorporate further thermoplastic olefin.

8. Claims 1-10, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dozeman (U.S. 2005/0215717).

Dozeman teaches a dynamically vulcanized composition comprising between 5-10 wt % of thermoplastic polyolefin, elastomer selected from EPM and/or EPDM (claims 1-5). The composition comprises 155-250 parts of oil per 100 parts of elastomer (paragraph [0018]). The oil/elastomer weight ratio is above 1.7 (paragraph [0019]). In the working examples, entry II of Table I shows a composition comprising 8.8 wt % of polypropylene homopolymer, 29.32 wt % of EPDM, and 58.70 wt % of oil (oil/EPDM ratio = 2.0) exhibiting a Shore A hardness of 30.

The deficiency of the composition of Dozeman is that it has an oil/elastomer ratio of 2/1, while the present claims require an oil/elastomer ratio of at least 2.1/1. It is apparent, however, that the instantly claimed ratio of 2.1/1 and the ratio of 2/1 taught by Dozeman are so close to each other that the fact pattern is similar to the one in *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) or *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) where, despite a slight difference in the ranges, the court held that such a difference did not “render the claims patentable,” or, alternatively, that “a *prima facie* case of obviousness exists where the claimed range and prior art range do not overlap, but are close enough so that one skilled in the art would have expected them to have the same properties.”

In light of the case law cited above, and given that there is only a slight difference between the ratio of 2/1 disclosed by Dozeman and the ratio of 2.1/1 disclosed in the present

Art Unit: 1796

claims and further, given the fact that no criticality is disclosed in the present invention with respect to the oil/elastomer ratio (composition of Dozeman exhibits the claimed Shore A hardness), it would have been obvious to one of ordinary skill in the art that the ratio of 2.1/1 recited in the present claims is but an obvious variant of the ratio disclosed in the prior art, and accordingly, one of ordinary skill in the art would have arrived at the claimed invention.

Dozeman does not quantify the degree of cure of the elastomer, however, it is reasonable to believe the level of cure lies within the claimed range because the Shore A hardness of the polymer composition is governed in part by the extent of cure of the elastomer. The reference is silent with respect to the granulometric properties, however, in light of the fact that the composition is substantially the same as that described in the instant claims, and in view of the fact that polymer exhibits the same Shore A hardness and good surface aspect, both of which would govern the anti-blocking characteristic exhibited in the specific test recited in the claims, a reasonable basis exists to believe that the composition of Dozeman is capable of exhibiting substantially the same properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Response to Arguments

9. The rejection of claims under 35 U.S.C. 112, 2nd paragraph, set forth in paragraph 2 of the previous office action dated October 28, 2008 has been withdrawn in view of appropriate claim amendment.

10. Applicant traverses the rejection of claims over Ouhadi (EP 757 077). Applicant submits that the determination of oil/elastomer ratio must be based on total amount of elastomer. Thus, Applicant calculates an oil/elastomer ratio of 1.58 based on 15.3 wt % of V 3666 EPDM and 14.30 wt % of Cariflex 1220. Applicant's argument has been considered fully, but it is not persuasive. Attention is drawn to the independent claim in which the claimed oil/elastomer ratio is based only on dynamically vulcanized elastomer consisting of monomer units of ethylene, an

Art Unit: 1796

alpha olefin and optionally one or more non-conjugated dienes. V 3336 EPDM meets this requirement, but Cariflex 1220, which is a polybutadiene rubber, does not. Accordingly, the oil/elastomer ratio of 3.05 was calculated based on V 3336 EPDM alone, just as required by claim limitations. Said ratio meets the claimed ratio set forth in claims 1, 16, and 17. In light of these considerations the rejection has been maintained.

11. Applicant The rejection of claims over Dozeman *et al.*, set forth in the previous office action has been withdrawn in view of claim amendment. The prior art teaches a thermoplastic vulcanizate comprising 5-70 pw of polyolefin, 30-95 pw of rubber, and oil wherein the oil/rubber ratio is between 0.7 and 2.0. It can be seen that the reference does not teach the claimed composition.

12. Applicant traverses the rejection of claims over Hamanka *et al.* (U.S. 5,187,224). Applicant submits that the determination of oil/elastomer ratio must be based on total amount of elastomer. Thus, Applicant calculates an oil/elastomer ratio of 1.89 based on 69 pw of EPDM and 100 pw of SEBS. Applicant's argument has been considered fully, but it is not persuasive. Attention is drawn to the independent claim in which the claimed oil/elastomer ratio is based only on dynamically vulcanized elastomer consisting of monomer units of ethylene, an alpha olefin and optionally one or more non-conjugated dienes. The EPDM meets this requirement, but SEBS, which is a styrenic block copolymer, does not. Accordingly, the oil/elastomer ratio of 4.62 was calculated based on EPDM alone, just as required by claim limitations. Said ratio meets the claimed ratio set forth in claims 1, 16, and 17. In light of these considerations the rejection has been maintained.

Art Unit: 1796

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Examiner, Art Unit 1796

May 29, 2009